REMARKS

Claims 1, 5-11, 13, 15-18, 20-35, and 37-44 remain in the application, with claims 1, 5, 6, 8-11, 13, 15-17, 20, 23, 30, 31, 37, 38, and 43 having been amended hereby, and claims 3, 4, 12, 14, 19, and 36 having been cancelled.

Reconsideration is respectfully requested of the rejection of claims 31, 32, 36 and 38-42 under 35 U.S.C. 112, second paragraph, as being indefinite.

Claim 31 has been amended hereby to positively recite that a detector receives the test signal from the controller. Thus, the subsequent recitation that the detector is an ultrasonic detector finds positive antecedent basis in the claim.

Accordingly, it is respectfully submitted that the claims are clear and definite in their recitation of the present invention and meet all requirements of 35 U.S.C. 112.

Reconsideration is respectfully requested of the objection to claim 15 as being in improper dependent form.

Claim 15 has been amended to depend from claim 1, which recites that the sensor senses one of temperature and humidity. Claim 15 adds the further limitation that the sensor senses both temperature and humidity.

Accordingly, it is respectfully submitted that claim 15 further limits the structure recited in claim 1.

Reconsideration is respectfully requested of the rejection of claims 16, 19-22, 25, 35, and 37 under 35 U.S.C. 102(e), as being anticipated by Yoshino et al.

As explained in the present specification, in an embodiment of the present invention, it has been learned that if a speaker is placed far from an optimized playback location, the time of travel of the signal to be played over the speakers will result in an audio playback that is suboptimal. Moreover, it has been learned that environmental conditions, such as temperature and humidity, also affect the speed of travel of the audio signals.

Accordingly, based on a test signal sent to a first speaker, which in turn is sent to the other speakers, the relative distances among the speakers can be determined. Based on the determined relative distances, the audio playback signals can be adjusted to compensate for differences in speaker placement from the optimal positions.

Additionally, environmental sensors disposed in the listening area adjacent to the speakers periodically report data of sensed temperature and humidity, which data is subsequently used to adjust the compensation data. Such compensation of the audio signals may be in the form of a change in volume, phase, or time delay of the signals sent to the speakers.

The claims have been amended hereby to emphasize the above-noted features of the present invention.

Yoshino et al. relates to an automatic sound field correcting system in which a digital signal processor is provided and a measurement signal generator is provided. A test signal, such as pink noise, is fed to the multiple speakers and the outputs of the speakers are detected by a microphone that is then fed back to the signal processing circuit and used as an input to make adjustments to the

outputs of the various speakers in the system. The signal processing circuit employs a coefficient operation unit that can correct frequency characteristics, interchannel level corrections and delay characteristics of the signal processing going on in the signal processing circuit.

Yoshino et al. does not determine the relative positions of the speakers in the system, as in the presently claimed invention. Yoshino et al. simply places the speakers in the locations in which they are desired and then performs the signal processing based either on stored values or values input by the user of the system. More importantly, however, Yoshino et al. is completely silent concerning the detection of any environmental conditions such as temperature and humidity, as in the presently claimed invention.

Therefore, it is respectfully submitted that Yoshino et al. fails to anticipate claims 16, 19-22, 25, and 35 and 37, as currently amended.

Reconsideration is respectfully requested of the rejection of claims 1 and 17 under 37 U.S.C. 103, as being unpatentable over Yoshino et al. in view of Noro et al.

As acknowledged by the Examiner, Yoshino et al. fails to show or suggest use of a sensor for sensing temperature and humidity. Noro et al. is cited for this feature.

Noro et al. relates to a system for protecting a speaker from being damaged when the voice coil heats up and Noro et al. provides a resistor in series with the voice coil and a temperature sensor that senses the temperature of the resistor. Thus, it is respectfully submitted that Noro et al. does not

suggest sensing the temperature and humidity of the environment of the speaker. Rather, all that Noro et al. provides is a monitor of the current value of the voice coil and thus attempts to prevent the failure of the speaker by making certain that the voice coil does not overheat.

Accordingly, even adding Noro et al. to Yoshino et al., all that would be provided is that the multiple speakers in Yoshino et al. would be provided with a system to prevent over driving the voice coil. There is no suggestion in either reference of detecting the temperature and humidity of the environment of the speaker, which loudspeaker's position had been previously determined as in the presently claimed invention.

Reconsideration is respectfully requested of the rejection of claims 8, 23, 26, 27, and 43 under 35 U.S.C. 103(a) as being unpatentable over Yoshino et al.

As noted hereinabove, the claims have been amended hereby to include the sensing of the environmental conditions along with the determination of the speaker placement in the listening area. These features are now included in the claims and, as noted hereinabove, Yoshino et al. fails to suggest determining or detecting environmental conditions and making adjustments to the signals, as in the presently claimed invention. Moreover, Yoshino et al. does not determine the relative positions of the loudspeakers and simply makes adjustments to the digital signal processor based on the results of the pink noise test detected by the microphone.

Accordingly, it is respectfully submitted that the claims are not rendered obvious by Yoshino et al.

Reconsideration is respectfully requested of the rejection of claims 8 and 30 under 35 U.S.C. 103(a), as being unpatentable over Yoshino et al. and Noro et al.

In regard to claim 8, claim 8 depends from claim 1 which, for the reasons set forth hereinabove, is thought to be patentably distinct over the cited references. Accordingly, it is submitted that using an ultrasonic detector to detect the relative positions of the speakers is not obvious in view of the deficiencies of Yoshino et al. and Noro et al.. In claim 30, the method further includes the steps of sensing both temperature and humidity. The temperature being sensed is the environmental temperature of the speakers not the temperature of the voice coil. Moreover, both references are completely silent concerning detecting humidity.

Reconsideration is respectfully requested of the rejection of claim 33 under 35 U.S.C. 103, as being unpatentable over Yoshino et al.

Claim 33 depends from claim 37 which, for the reasons set forth hereinabove, is thought to be patentably distinct over the cited references and, for at least those very same reasons, claim 33 is also submitted to be patentably distinct thereover. Moreover, the use of an ultrasound detector to determine the positions of the speakers in light of the additional sensing of temperature and humidity is not obvious in view of Yoshino et al.

Reconsideration is respectfully requested of the rejection of claim 28 under 35 U.S.C. 103(a), as being unpatentable over Yoshino et al. in view of Pulfrey.

Claim 28 depends from claim 23 which, for the reasons set forth hereinabove, is thought to be patentably distinct over the cited references and, for at least those very same reasons, claim 28 is also submitted to be patentable distinct thereover.

Claim 28 recites that the sensor that senses the temperature and humidity of the environment of the speakers is located in every one of the speakers.

Pulfrey relates to a specialized speaker for producing high fidelity and employs a transducer that detects the speed of the diaphragm as the speaker is being driven. This transducer employs magnets and a coil and does not relate to a microphone as suggested. Moreover, Pulfrey fails to cure the deficiencies of Yoshino et al. relating to detecting speaker position as well as the temperature and humidity of the environment of the speakers, as taught by the present invention.

Reconsideration is respectfully requested of the rejection of claims 3-7, 9-13 and 15 under 35 U.S.C. 103(a), as being unpatentable over Yoshino et al. and Noro et al., in view of Pulfrey.

Claims 3-7, 9-13 and 15 depend from claim 1 which, for the reasons set forth hereinabove, is thought to be patentably distinct over the cited references and, for at least those very same reasons, claims 3-7, 9-13 and 15 are also submitted to be patentably distinct thereover.

As noted hereinabove, Noro et al. fails to detect the temperature and humidity of the speaker environment and only provides an overload protection

circuit for the voice coil of the speaker. Furthermore, Pulfrey does not cure the deficiencies of Yoshino et al. as noted hereinabove.

Reconsideration is respectfully requested of the rejection of claims 24 and 34 under 35 U.S.C. 103(a), as being unpatentable over Yoshino et al. in view of Pulfrey.

As noted hereinabove, Pulfrey provides a measuring transducer in the form of a permanent magnet and a coil as shown in Figs. 3 and 4 and does not employ the loudspeaker as a microphone, as in the presently claimed invention.

Accordingly, by reasons of the amendments made to the claims hereby, as well as the above remarks, it is respectfully submitted that a method and apparatus for controlling a plurality of speakers in a listening area in which the relative positions of the speakers are determined and the humidity and temperature of the environment of the speakers is also sensed and utilized to provide compensation to the audio signals in the form of alterations to the electrical characteristics of that audio signal, as taught by the present invention and is recited in the amended claims, is neither shown nor suggested in the cited references, alone or in combination.

The allowance of claim 44 is noted.

Favorable reconsideration is earnestly solicited.

Respectfully submitted,

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